

Physical characteristics		Chemical characteristics		Biological characteristics		Ecological characteristics		Economic characteristics	
Parameter	Value	Parameter	Value	Parameter	Value	Parameter	Value	Parameter	Value
Length	100 cm	Weight	10 kg	Sex	Male	Age	10 years	Species	Salmon
Height	150 cm	Volume	100 L	Color	Red	Size	Large	Genus	Salmo
Weight	10 kg	Temperature	10°C	Texture	Soft	Shape	Round	Family	Salmonidae
Volume	100 L	pH	7.0	Taste	Salty	Smell	Fresh	Order	Pisces
Temperature	10°C	Salinity	10 g/L	Appearance	Shiny	Consistency	Firm	Class	Pisces
pH	7.0	Hardness	100 mg/L	Behavior	Active	Flavor	Delicious	Order	Pisces
Salinity	10 g/L	Alkalinity	100 mg/L	Reproduction	High	Quality	High	Class	Pisces
Hardness	100 mg/L	Acidity	100 mg/L	Growth	Fast	Quantity	High	Order	Pisces
Alkalinity	100 mg/L	Conductivity	100 mg/L	Survival	High	Value	High	Class	Pisces
Acidity	100 mg/L	Resistivity	100 mg/L	Health	Good	Price	High	Order	Pisces
Conductivity	100 mg/L	Capacitance	100 mg/L	Longevity	Long	Availability	High	Class	Pisces
Resistivity	100 mg/L	Inductance	100 mg/L	Reproduction	High	Quality	High	Order	Pisces
Capacitance	100 mg/L	Impedance	100 mg/L	Growth	Fast	Quantity	High	Class	Pisces
Inductance	100 mg/L	Reactance	100 mg/L	Survival	High	Value	High	Order	Pisces
Impedance	100 mg/L	Phase shift	100 mg/L	Health	Good	Price	High	Class	Pisces
Phase shift	100 mg/L	Power factor	100 mg/L	Longevity	Long	Availability	High	Order	Pisces
Power factor	100 mg/L	Efficiency	100 mg/L	Reproduction	High	Quality	High	Class	Pisces
Efficiency	100 mg/L	Losses	100 mg/L	Growth	Fast	Quantity	High	Order	Pisces
Losses	100 mg/L	Cost	100 mg/L	Survival	High	Value	High	Class	Pisces
Cost	100 mg/L	Revenue	100 mg/L	Health	Good	Price	High	Order	Pisces
Revenue	100 mg/L	Profit	100 mg/L	Longevity	Long	Availability	High	Class	Pisces
Profit	100 mg/L	Loss	100 mg/L	Reproduction	High	Quality	High	Order	Pisces
Loss	100 mg/L	Gain	100 mg/L	Growth	Fast	Quantity	High	Class	Pisces
Gain	100 mg/L	Net income	100 mg/L	Survival	High	Value	High	Order	Pisces
Net income	100 mg/L	Operating income	100 mg/L	Health	Good	Price	High	Class	Pisces
Operating income	100 mg/L	Pre-tax income	100 mg/L	Longevity	Long	Availability	High	Order	Pisces
Pre-tax income	100 mg/L	After-tax income	100 mg/L	Reproduction	High	Quality	High	Class	Pisces
After-tax income	100 mg/L	Net profit	100 mg/L	Growth	Fast	Quantity	High	Order	Pisces
Net profit	100 mg/L	Operating profit	100 mg/L	Survival	High	Value	High	Class	Pisces
Operating profit	100 mg/L	Pre-tax profit	100 mg/L	Health	Good	Price	High	Order	Pisces
Pre-tax profit	100 mg/L	After-tax profit	100 mg/L	Longevity	Long	Availability	High	Class	Pisces
After-tax profit	100 mg/L	Net loss	100 mg/L	Reproduction	High	Quality	High	Order	Pisces
Net loss	100 mg/L	Operating loss	100 mg/L	Growth	Fast	Quantity	High	Class	Pisces
Operating loss	100 mg/L	Pre-tax loss	100 mg/L	Survival	High	Value	High	Order	Pisces
Pre-tax loss	100 mg/L	After-tax loss	100 mg/L	Health	Good	Price	High	Class	Pisces
After-tax loss	100 mg/L	Net gain	100 mg/L	Longevity	Long	Availability	High	Order	Pisces
Net gain	100 mg/L	Operating gain	100 mg/L	Reproduction	High	Quality	High	Class	Pisces
Operating gain	100 mg/L	Pre-tax gain	100 mg/L	Growth	Fast	Quantity	High	Order	Pisces
Pre-tax gain	100 mg/L	After-tax gain	100 mg/L	Survival	High	Value	High	Class	Pisces
After-tax gain	100 mg/L	Net revenue	100 mg/L	Health	Good	Price	High	Order	Pisces
Net revenue	100 mg/L	Operating revenue	100 mg/L	Longevity	Long	Availability	High	Class	Pisces
Operating revenue	100 mg/L	Pre-tax revenue	100 mg/L	Reproduction	High	Quality	High	Order	Pisces
Pre-tax revenue	100 mg/L	After-tax revenue	100 mg/L	Growth	Fast	Quantity	High	Class	Pisces
After-tax revenue	100 mg/L	Net cost	100 mg/L	Survival	High	Value	High	Order	Pisces
Net cost	100 mg/L	Operating cost	100 mg/L						



RAZORS

This is a continuation of International Application No. PCT/GB00/00480 with an international filing date of February 14, 2000.

This invention relates to the field of shaving and, more especially, to so-called "wet shaving" in the process of which a razor with one or more sharpened cutting edges is moved over the skin to sever hairs projecting from the skin. In association with wet shaving it is usual to apply to the skin a preparation, such as shaving soap, which can be applied by means of a brush, shaving foam or shaving gel to improve the conditions for actual shaving. The need to prepare the skin in this way as part of the overall shaving procedure is an inconvenience and adds significantly to the time required to complete a satisfactory shave. It is also desirable sometimes to apply fluids of other kinds to the skin when shaving.

There have been many proposals for razors which include a system for conveying a shaving preparation, e.g., a lubricating fluid, from a reservoir incorporated in the razor structure, such as an aerosol container which serves as the razor handle, to a dispensing location near the head of the razor. However, as far as known to the Applicant none of these prior proposals have been found to be commercially acceptable. Many modern safety razors have blade units which are movably mounted, in particular pivotable, relative to the handle structures on which they are mounted either permanently, in the case of disposable safety razors intended to be discarded when the blade or blades have become dulled, or detachably to allow replacement of the blade unit on a reusable handle structure. The lubricant fluid delivery systems proposed according to the prior art are not ideally suited to such razors. In addition they are generally awkward to use and demand a degree of dexterity on the part of the user who typically is required to press a button to open a valve for fluid to be discharged from the reservoir for delivery to the razor head.

Some examples of previously proposed razors with fluid delivery

Claims:

1. A razor comprising a blade unit carrying structure on which a blade unit is mounted or mountable for pivotal movement about a predetermined axis, and a delivery system for conducting a fluid dispensed from a reservoir connected to the blade unit carrying structure to at least one discharge port, wherein the discharge port opening is at or close to the predetermined pivot axis.
2. A razor according to claim 1, wherein the discharge port opening is defined by a part which remains stationary with respect to the blade unit carrying structure during pivotal movement of the blade unit about the predetermined axis.
3. A razor according to claim 2, wherein the stationary part is not mechanically coupled directly to the blade units.
4. A razor according to claim 1, wherein the discharge port is disposed to deliver the fluid at a guard surface of the blade unit.
5. A razor according to claim 1, wherein the blade unit includes a channel for distributing fluid delivered through the discharge port across the blade unit in the direction of the pivot axis.
6. A razor according to claim 5, wherein the channel extends substantially parallel to the pivot axis.
7. A razor according to claim 6, wherein the channel is open continuously along the length thereof to allow fluid to pass out of the channel.

8. A razor according to claim 1, wherein the discharge port is defined by a tubular member, and the blade unit includes an elastomeric skin contacting element having a lip surrounding and sealing against the tubular member adjacent the discharge port.

9. A razor according to claim 1, wherein the blade unit carrying structure is movably connected to a supporting structure and is movable relative to the supporting structure for actuating a valve included in the delivery system to control flow of fluid to the discharge port.

10. A razor according to claim 9, wherein the blade unit carrying structure is hingedly coupled to the supporting structure for the valve to be actuated by movement of the blade unit carrying structure caused by pressing the blade unit against the skin during shaving.

11. A razor comprising a blade unit carrying structure on one end of which a blade unit is mounted or mountable for pivotal movement relative to the carrying structure, an opposite end of the blade unit carrying structure being hingedly connected to a supporting structure, a delivery system for conducting a fluid to the blade unit from a reservoir, the delivery system including a valve for controlling supply of fluid to the blade unit, the blade unit carrying structure being coupled to the valve for the valve to be actuated by displacement of the blade unit carrying structure relative to the supporting structure caused by pressing the blade unit against the skin during shaving, and the blade unit carrying structure being resiliently biased to close the valve when the blade unit is lifted clear of the skin.

12. A razor blade unit carrying structure on one end of which a blade unit is mounted or mountable for pivotal movement relative to the carrying structure, the carrying structure including a delivery duct for conducting a fluid supplied from a reservoir to the blade unit, an opposite end of the carrying structure being hingedly coupled to a supporting structure for a valve which is operable to control supply of fluid to the delivery duct from the reservoir to be actuated by displacement of the blade unit carrying structure relative to the supporting structure at the hinge coupling therebetween caused by pressing the blade unit against the skin during shaving.

13. A razor according to claim 11, wherein the blade unit carrying structure and the supporting structure are integrally connected.

14. A razor or razor blade unit carrying structure as defined in claim 13, wherein the blade unit carrying structure and the supporting structure are integrally connected by at least one flexible web.

15. A razor or razor blade unit carrying structure as defined in claim 14, wherein the supporting structure comprises a ring to which the blade unit carrying structure is integrally connected by a pair of laterally opposed webs.

16. A razor according to claim 9, wherein the reservoir is formed by a container having a rim surrounding the valve, and the supporting structure is firmly attached to the container at the rim thereof.

17. A razor according to claim 16, wherein the supporting structure has a friction or snap-fit engagement with the container rim.

18. A razor according to claim 15, wherein the blade unit carrying structure has a stop for abutment with the container rim to define an end position from which the blade unit carrying structure is pivotable to actuate the valve.

19. A razor according to claim 16, wherein the valve includes a valve member protruding beyond the container rim and into an inlet aperture formed by the blade unit carrying structure.

20. A razor according to claim 21, wherein the inlet aperture is defined by an annular sealing member.

21. A razor according to claim 20, wherein the valve member cooperates with an annular valve seat and is capable of tilting to open the valve.

22. A razor or blade unit carrying structure according to claim 9, wherein the blade unit carrying structure comprises a hollow stem structure extending from a flange-like base, the base being engagable by a finger of a hand in which the razor is held for selectively displacing the blade unit carrying structure to actuate the valve.

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## RAZORS

This invention relates to the field of shaving and, more especially, to so-called "wet shaving" in the process of which a razor with one or more sharpened cutting edges is moved over the skin to sever hairs projecting from the skin. In association with wet shaving it is usual to apply to the skin a preparation, such as shaving soap, which can be applied by means of a brush, shaving foam, or shaving gel to improve the conditions for actual shaving. The need to prepare the skin in this way as part of the overall shaving procedure is an inconvenience and adds significantly to the time required to complete a satisfactory shave. It is also desirable sometimes to apply fluids of other kinds to the skin when shaving.

There have been many proposals for razors which include a system for conveying a shaving preparation, e.g. a lubricating fluid, from a reservoir incorporated in the razor structure, such as an aerosol container which serves as the razor handle, to a dispensing location near the head of the razor. However, as far as known to the Applicant none of these prior proposals have been found to be commercially acceptable. Many modern safety razors have blade units which are movably mounted, in particular pivotable, relative to the handle structures on which they are mounted either permanently, in the case of disposable safety razors intended to be discarded when the blade or blades have become dulled, or detachably to allow replacement of the blade unit on a reusable handle structure. The lubricant fluid delivery systems proposed according to the prior art are not ideally suited to such razors. In addition they are generally awkward to use and demand a degree of dexterity on the part of the user who typically is required to press a button to open a valve for fluid to be discharged from the reservoir for delivery to the razor head.

Some examples of previously proposed razors with fluid delivery

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Claims:

1. A razor comprising a blade unit carrying structure on which a blade unit is mounted or mountable for pivotal movement about a predetermined axis, and a delivery system for conducting a fluid dispensed from a reservoir connected to the blade unit carrying structure to at least one discharge port, wherein the discharge port opening is at or close to the predetermined pivot axis.
2. A razor according to claim 1, wherein the discharge port opening is defined by a part which remains stationary with respect to the blade unit carrying structure during pivotal movement of the blade unit about the predetermined axis.
3. A razor according to claim 2, wherein the stationary part is not mechanically coupled directly to the blade units.
4. A razor according to <sup>claim 1</sup> [claims 1, 2 or 3] wherein the discharge port is disposed to deliver the fluid at a guard surface of the blade unit.
5. A razor according to <sup>claim 1</sup> [any one of claims 1 to 4] wherein the blade unit includes a channel for distributing fluid delivered through the discharge port across the blade unit in the direction of the pivot axis.
6. A razor according to claim 5, wherein the channel extends substantially parallel to the pivot axis.
7. A razor according to claim 6, wherein the channel is open continuously along the length thereof to allow fluid to pass out of the channel.

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8. A razor according to any one of claims 1 to 7 wherein the discharge port is defined by a tubular member, and the blade unit includes an elastomeric skin contacting element having a lip surrounding and sealing against the tubular member adjacent the discharge port.

9. A razor according to any one of claims 1 to 8 wherein the blade unit carrying structure is movably connected to a supporting structure and is movable relative to the supporting structure for actuating a valve included in the delivery system to control flow of fluid to the discharge port.

10. A razor according to claim 9, wherein the blade unit carrying structure is hingedly coupled to the supporting structure for the valve to be actuated by movement of the blade unit carrying structure caused by pressing the blade unit against the skin during shaving.

11. A razor comprising a blade unit carrying structure on one end of which a blade unit is mounted or mountable for pivotal movement relative to the carrying structure, an opposite end of the blade unit carrying structure being hingedly connected to a supporting structure, a delivery system for conducting a fluid to the blade unit from a reservoir, the delivery system including a valve for controlling supply of fluid to the blade unit, the blade unit carrying structure being coupled to the valve for the valve to be actuated by displacement of the blade unit carrying structure relative to the supporting structure caused by pressing the blade unit against the skin during shaving, and the blade unit carrying structure being resiliently biased to close the valve when the blade unit is lifted clear of the skin.

12. A razor blade unit carrying structure on one end of which a blade unit is mounted or mountable for pivotal movement relative to the carrying structure, the carrying structure including a delivery duct for conducting a fluid supplied from a reservoir to the blade unit, on opposite end of the carrying structure being hingedly coupled to a supporting structure for a valve which is operable to control supply of fluid to the delivery duct from the reservoir to be actuated by displacement of the blade unit carrying structure relative to the supporting structure at the hinged coupling therebetween caused by pressing the blade unit against the skin during shaving.

13. A razor according to claim 11, [or a razor blade unit carrying structure according to claim 14,] wherein the blade unit carrying structure and the supporting structure are integrally connected.

14. A razor or razor blade unit carrying structure as defined in claim 13, wherein the blade unit carrying structure and the supporting structure are integrally connected by at least one flexible web.

15. A razor or razor blade unit carrying structure as defined in claim 14, wherein the supporting structure comprises a ring to which the blade unit carrying structure is integrally connected by a pair of laterally opposed webs.

claim 9  
16. A razor according to [any one of claims 9 to 15] wherein the reservoir is formed by a container having a rim surrounding the valve, and the supporting structure is firmly attached to the container at the rim thereof.

17. A razor according to claim 16, wherein the supporting structure has a friction or snap-fit engagement with the container rim.

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18. A razor according to claim 15, [16 or 17], wherein the blade unit carrying structure has a stop for abutment with the container rim to define an end position from which the blade unit carrying structure is pivotable to actuate the valve.

claim 16

19. A razor according to [any one of claims 16 to 18] wherein the valve includes a valve member protruding beyond the container rim and into an inlet aperture formed by the blade unit carrying structure.

20. A razor according to claim 21 wherein the inlet aperture is defined by an annular sealing member.

21. A razor according to claim 20 [or 21], wherein the valve member cooperates with an annular valve seat and is capable of tilting to open the valve.

claim 9

22. A razor or a razor blade carrying unit according to [any one of claims 9 to 21], wherein the blade unit carrying structure comprises a hollow stem structure extending from a flange-like base, the base being engagable by a finger of a hand in which the razor is held for selectively displacing the blade unit carrying structure to actuate the valve.

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